

Research for Sustainable Development Goals



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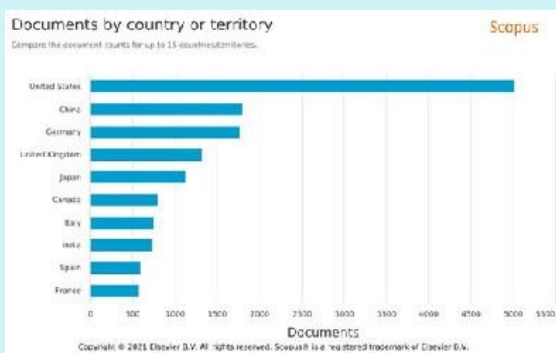
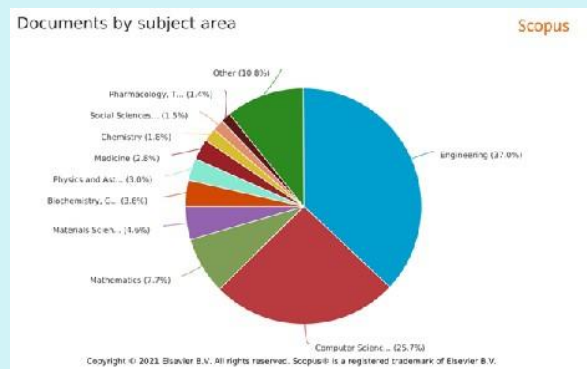
Research is a systematic investigation into and study of materials and sources to establish facts and reach new conclusions. Research nourishes our minds, gives us the latest information, and expands our knowledge. Research helps us in problem-solving and help the community by providing life-changing solutions, Currently, less than 1% of India's higher education institutions engage in research. It means the nation's faculty and students in higher education institutions are not involved with knowledge creation. Is it so dull? Is it not important? But it's a fact that there has been- a massive loss to India's research potential. India is a vast and leading country with many problems to address. The United Nations has put forth the 2030 agenda for sustainable development. This has been adopted by all United Nations Member States in 2015, provides a shared roadmap for peace and prosperity for people and the planet, now and into the future. It proposes 17 Sustainable Development Goals (SDGs), which are of the highest priority for action by all countries - developed and developing - in a global partnership. India secured a rank of 120 in SDG 2021 rankings.



Figure: SDG Ranking

Societal challenges that India has today, such as access for all its citizens clean drinking water and sanitation, quality education and healthcare, social equity, improved transportation, sustainable infrastructure, elimination of poverty, air quality, clean energy, quality of life on land and underwater and reversing climate change and its negative impact. This will require the implementation of approaches and solutions from engineers and technocrats. Facing and addressing these challenges will need high-quality, interdisciplinary research across fields, which must be conducted in India and cannot be imported.

Research outcomes are measured in terms of publications and patents. India has been doing somewhat better in terms of publications, showing steady growth in its output, and taking India's share of scientific publications from 3.1% in 2009 to 4.4% in 2013 to 4.8% in 2016. However, a 2018 compilation of Science and Engineering indicators by the U.S. National Science Foundation showed that the USA (17.8%) and China (18.6%) published approximately four times as many articles as India in 2016. Here the example of the field "Robotics and Automation." is taken into consideration to publication search. The following figures show statistics from Scopus search for "Robotics and Automation."



The contribution of engineers worldwide in the field of Robotics and Automation is 37% in Scopus databases. India stands in 8th position in publications in Robotics and Automation, which need to be improved by all of us. Though in terms of the total number of publications, India stands at the 5th position globally, in terms of the citation impact, India is much lower at the 11th position. Only 15.8% of the total publications are in the top 10 journals, e.g., 27.6% in China and 36.2% in the U.S. The overall quality of our research and innovation is currently not up to current global standards. India lags other nations in the number of patents produced. According to the World Intellectual Property Organization (WIPO) 2017 report, as many as 13,81,584 patent applications were made by China, and 6,06,956 by USA, but a mere 46,582 by India - of which non-resident Indians made approximately 68%. To achieve better research outcomes regarding patents and publications, we need to emphasize developing students' mindsets through experiential learning and consistent questioning. Frequent brainstorming sessions are required for idea generation to achieve sustainable development goals by empathizing. We need to enforce "Think Globally Act Locally" and contribute to solving local problems or sustainable development targets through interdisciplinary projects. Various online learning platforms are available to develop knowledge and skills required for research which should be utilized to the fullest. Students should use centers of excellence and research labs to get an opportunity to work on real-life problems. The outcomes of research need to be published primarily in terms of patents and papers and convert them into startups. It is also well-understood that a research culture across disciplines enables a nation to adapt and apply relevant research from abroad quickly. Let's join brains together for multidisciplinary projects to make India leading.

References:

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